Swami Ramanand Teerth Marathwada University, Vishnupuri Nanded.

For the Registration of Doctorate Degree in Botany

"Studies on Antimicrobial & Antioxidant Properties Producing Medicinal Plant Around Nanded Districts of Maharashtra"

By

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1) Abstract of proposed work plan / problem :

About 35,000- 70, 000 species are used as mdeicinal plants among 4,22,127 species of plants. The World Health Organization reported that 80% of the world population depend on traditional medicinal plants.

In the present study vegetative and reproductive parts of plants of "***Withania Somnifera &...Cassia Sophera". are selected for research.*** The frequency of life threatening infections caused by pathogenic microorganisms has increased World Wide & is becoming an important cause of morbidity and mortality in immune compromised patients in developing countries. Herbal remedies used in traditional medicines provide an interesting & still largely unexplored source for the creation & development of potential new drugs.

"Accordingly, attention is focused on the protective biochemical functions at naturally occurring antioxidants in the cells of organisms containg them" (Larson, 1988 ; Halliwell, 1997). "Antioxidants in the oils are important in the stabilization of free fatty acids" (Six, 1994, Baldioli al 1996). "The antioxidant activity of phenols & other compounds present in oil has been well & widely studied by several authors" (Litridou et al 1997 , Visidi et al 1998 ; Yoshida & Takagi, 1999).

Withania somnifera commonly known as ***Ashwagand*** belongs to family ***solanaceae*** is the major Indian medicinal plant used in Ayurveda, Siddha & Unani system of medicine.

Cassia sophera belongs to family ***caesal piniaceae*** & commonly known as Seena sophera & kasonoli.

In the present study, the aqueous, methanolic & ethanolic extracts of ***Withania somnifera*** were evaluated for antimicrobial and antioxidant effects against some common pathogens.

The aqueous, methanolic & ethanolic extracts of ***Cassia sophera*** were evaluated for antimicrobial and actioxidant effects against same common pathoges & uropathogenic bacteria causing (U.T.E.)

In my research I interest to screen these plants, in order to validate their use in medicine and to reveal their active principles by isolation and characterization of their constituents. Very little research has investigated the relationships between the traditional medicinal plants parts and microbial and anti oxident activity. Therefore by considering the above facts and also it is an academically excellent opportunity to explore traditional floral wealth of Nanded region for its possible effect on microbial and antioxident properties.

2) Review of Literature & Developed in the subject (Previous work done in the relevent area)

Herbal medicines are popular as treatment against various diseases by majority of world's population. Polyherbal preparation are the products derived from medicinal plants. These are considered as safe since they are natural products. These natural products accept wide spread as therapeutic agents world wide, includes antibacterial, antioxidant, antidiabetic antiinflamatory and lipid lowering agents.

Medicinal effects of many plants have been studied in various laboratories all over the world. China is a country where traditional herbal medicine are widely used.

In the beginning of the Nineteenth century, John Flemming contributed a apex on the medicinal plants of India a monograph of great value.

"Mariam (1947)" observed the antibiotic activity in the alcoholic extracts of O***cimum sanctum*** leaves against ***Staphylococcus aureus and Escherichia coli..*** Kurup (1956) reported the presence of antibiotic principles in the leaves of ***Withania somnifera.***

Kurup (1958) also isolated an antibacterial principle from ***Withania somnifera*** where as Bungi (1960) observed the fungistatic action at alcoholic extract of its leaves against some organisms. i.e. ***Trichophyton mentagraphytes, Microsporum Jypseum*** and ***Epidernophyton floccosum.***

Ruban and Gajalakshmi (2012) tested the in vitro antibacterial activity of ***Hibiscus rosa-sinensis*** flower extract against the human pathgens using disc and agar diffusion methods.

Upadhyay and Rai (1990) examined leaf extracts of thirteen medicinal plants that is ***Azadirachta indica, Cassia sophera, Cassia fora, Ocimum sanctum etc*** against ***Curvuaria tuberculata*** responsible for die-back disease.

Palanichamy & Nagarajan (1990) also reported antifungal activity of C***assia alffa*** leaf extract. Qiao et al, (1996) isolated twelve compounds from the roots at ***Rubia cordifolia*** L – only three of them exhibited mild antibacterial activity.

The result of this study reveals that these plants posses significant antimicrobial and antioxidant activity.

3) Objective of Research / Proposed Hypothesis :

The objectives of the proposed work are as follows.

- To collect different traditional medicinal plant parts from Nanded Districts region.
- To extract the samples in different solvents for partitioning the plant ingredients of nature.

- To study in-vitro antimicrobial inhibition activity of selected parts of plant extracts.
- To study of in vitro antioxidant activity at selected parts of plant extracts.
- To study in vivo antimicrobial activity at selected parts of plant extracts in suitable bacteria isolates tested by disc & agar diffusion methods.

4) Methodolgy to be adopted :

a) Collection of plant samples :

The plants will be collected from different localities and in different seasons depend up on flowerings, fruiting period of the plant. The locality and habitat of the plants to be collected will be documented in the form of photography. The plants will be identified using the flora of Marathwada Region (Naik, 1998).

b) Extraction of samples :

The collected plants parts root, stem flower, fruit will be dry, preserved made in powder forms. The dry powder are stored using solvents. The extract will be vacuum dried and maintained for further studies.

c) Inhibition studies :

The strains were maintained and tested on Tryptone soya agar (bacteria) and Sabouraud Dexlrose agar (Mycetes). Disc diffusion test-for antimicrobial testing, a 20% (W/V) stock solution of each dry extract (methods A & B) was prepared in pure dimethylsulfoxide (DMSO; BDH, Nilan, Italy)

d) Antioxidant evaluation studies:

The DPPH Radical Scavenging assay will be carried out according to Roberta et al (2006) and OH radical scavenging Activity of the test samples will be carried out by employing the method reported by Rollet labelle et al (1998).

e) In-Vivo antimicrobial activity studies :

The different parts of plant extracts showing considerable antioxidant potential and maximum antimicrobial inhibition will be subjected for In-vivo antimicrobial studies in the bacteria.

5) Important of study / society application :

Pharmacological effects of many plants have been studied in various Laboratories all over the world. Polyherbal preparations are the products derived from medicinal plants. They are considered as safe since they are natural products. Herbal formulation which have attained widespread acceptability as therapeutic agents worldwide, includes antimicrobial, antioxidant, anti diabetic, anti inflammatory, heapato protective and lipid lowering agents. Packet insets providing details regarding safety and warning are not required for the sale of these, which available as over the counter medicines.

Infectious disease are the world's leading cause of premature death, killing almost 50,000 people every day Morbidity and Mortality due to diarrhea continues to be a major problem in many developing countries, especially amongst children. Infections due to variety of bacterial etiologic agent such as pathogenic ***Escherichia coli***, ***Salmonela spp . staphylococcus aureus*** are most common.

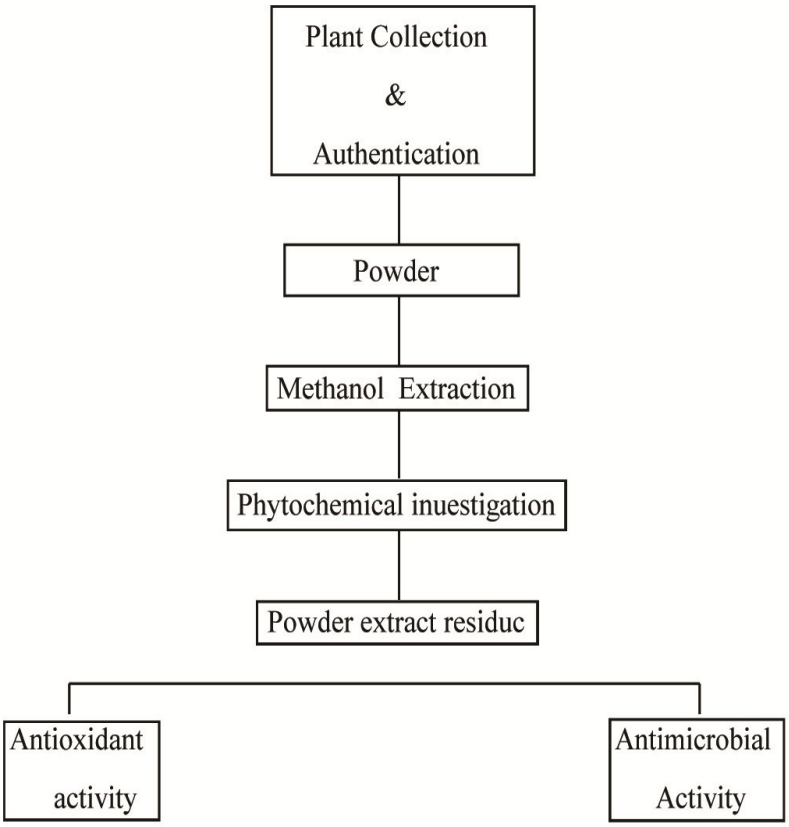
With the continuous use of antibiotic microorganism has become resistant. Addition to this problem, antibiotics are sometimes associated with adverse effects on host which include hypersensitivity, immunes uppresant & allergic reactions. This has created immense clinical problems in the treatment at infections diseases.

Therefore, there is a need to develop alternative antimicrobial drugs for the treatment of infections diseases, one approach is to screen local medicinal plants for possible antimicrobial properties. Plant products an important resource to combat serious diseases in the world.

This investigation is great important as for use of selected plant by the pharmaceutical industries for preparing plant based antimicrobial drugs for the tretment of many infectious.

Withania somnifera and C***assia sophera*** are available in the Nanded region.

THE WORK PLAN



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Research Student **Research Guide**

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